WHAT IS CLAIMED IS:

1. A single mode photonic crystal fiber comprising a core with a geometric radius ρ, and a cladding surrounding the core, the

5   cladding including a plurality of cylindrical air holes which extend in a longitudinal direction of the fiber, have a diameter d, and are arranged periodically at center-to-center spacings of Λ, wherein

said core and said cladding are made of glass or plastics,

10 and

a design is made such that the center-to-center spacing Λ between said air holes is made 1.5 or more times greater than a wavelength λ of propagation light, and a normalized frequency V given by the following expression is made greater than 2.4

15 and less than 3.3:

$$V = \frac{2\pi\rho}{\lambda}\left(n^2_{core} - n^2_{eff}\right)^{1/2}$$

where n_{eff} is an effective refractive index of said cladding,

20 and n_{core} is a refractive index of said core.

2. The single mode photonic crystal fiber as claimed in claim 1, wherein at least one of geometric placement of said air holes in said cladding and optical constant distribution of said

25 cladding or of said core is set in a manner as to make less than three-fold rotational symmetry with respect to a central axis of said core, and the degeneracy of polarization modes of propagation light is removed.

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